

COPY

LISTING OF THE CLAIMS

The listing of the claims provided below is intended to replace all prior versions of the claims. Please amend the claims as follows:

1. (Canceled)

2. (Currently Amended) A progressive die according to Claim 3, wherein said die further comprises a pilot cutting means punch for cutting at least one pilot hole in said discs, and said additional die station comprises stations comprise at least one pilot pin means being positioned and shaped to extend through said at least one pilot hole for orienting said discs in said additional die stations.

3. (Currently Amended) A progressive die for shaping a consecutive series of adjacent generally planar motor lamination discs from a strip of relatively stiff material, each of said discs having a geometric center, said strip having a longitudinal center line and said geometric centers falling substantially on said center line and wherein distances between said geometric centers vary both longer and shorter than a nominal distance over a length of said strip, said die comprising a series of adjacent die stations including an initial die station and one or more additional die stations which receive said strip and which shape said discs, said die including means for enabling changes in the distances between said geometric centers of said adjacent discs while maintaining said geometric centers substantially on said center line, said means for enabling changes comprising a slot cutting punch at the initial die station means for forming at least one a plurality of laterally extending slot slots between adjacent discs while leaving and for simultaneously forming at least two three narrow deformable bridges connecting said adjacent discs, said bridges having a lateral width and thickness sufficient to enable deformation thereof deform at additional die stations following said initial die station to either increase or both decrease the distance between said geometric centers of said adjacent discs to shorten said longer distances and increase the distance between said geometric centers of said adjacent discs to lengthen said shorter distances to align with die station centers as the strip moves through the die stations, while maintaining said geometric centers substantially on at least one additional die station following said slot cutting means and including cutting means for shaping said discs, and said slot cutting means forming at

COPY

least one of said bridges with portions which are disposed at an angle relative to said center line to facilitate said deformation.

4. (Previously Presented) A progressive die according to Claim 3, wherein said bridges have the shape of a chevron.

5. (Canceled)

6. (Currently Amended) Apparatus according to Claim 7, wherein ~~two~~ of said narrow deformable bridges are comprise four bridges with two provided on each side of and spaced from said center line.

7. (Currently Amended) Apparatus comprising a strip of relatively stiff material including a series of consecutive generally planar motor lamination discs formed along the a length thereof, each of said discs including a center and said centers falling substantially on an imaginary center line of said strip, at least two adjacent discs having at least one a plurality of laterally extending slot slots therebetween forming at least two three narrow deformable bridges connecting said adjacent discs, said bridges having a lateral width and thickness sufficient to enable deformation thereof deform to either both increase or decrease the distance between said centers of said adjacent discs when longer than die center-to-center distances and increase the distance between said centers when shorter than the die center-to-center distances during die formation of said discs while maintaining said centers substantially on said center line, and at least one of said bridges including portions which are chevron-shaped.

8. (Currently Amended) Apparatus according to Claim 7, wherein both each of said two narrow deformable bridges include portions which are chevron shaped.

COPY

9. (Currently Amended) Apparatus according to Claim [[5]] 7, wherein each of said discs further has a pilot hole formed therein at substantially said center and a plurality of pilot holes formed therein spaced from said center.

10. (Currently Amended) Apparatus according to Claim [[5]] 7, wherein said strip has a scroll or zip-zag shape.

11. (Currently Amended) Apparatus according to Claim [[5]] 7, wherein said relatively stiff generally planar material is motor lamination steel.

12. (Canceled)

13. (Currently Amended) A process for punching a series of shaped motor lamination discs from an elongate[[d]] strip of relatively stiff material formed by pairs of to form adjacent discs, the process comprising the steps of simultaneously cutting and shaping said series of shaped motor lamination discs at a plurality of stations including a slot cutting station and a plurality of intermediate stations, said series of shaped motor lamination discs and said plurality of stations each having centers, said plurality of stations and said strip having an imaginary center line and said centers falling substantially on said center line, cutting at said slot cutting station at least one slot through said strip between each pair of adjacent discs, said slot forming at least two narrow deformable bridges connecting each pair of said adjacent discs, orienting each disc of said series of shaped motor lamination discs at said intermediate stations while shaping each said disc[[s]] between said bridges at said intermediate stations, and enabling the distances between said pairs of adjacent discs at said intermediate stations to be adjusted both increased to match a die distance between centers of two of said plurality of stations when shorter than the die distance, and decreased to match the die distance between centers of two of said plurality of stations when longer than the die distance by simultaneously deforming said bridges while maintaining said centers of said adjacent discs substantially on said center line when the distances between said centers of said adjacent discs differ from are respectively lesser than or greater than the distances between said centers of said stations, each of said discs having outer sides, and further

COPY

comprising the step of engaging said outer sides of a disc which is adjacent said slot cutting station and thereby orienting said disc at said slot cutting station while cutting said at least one slot.

14. (Currently Amended) A process for punching a series of shaped generally planar motor lamination discs from an elongate[[d]] motor lamination strip of relatively stiff motor lamination material formed by pairs of adjacent discs, said strip having a longitudinal center line, the process comprising the steps of:

simultaneously progressively cutting and shaping said series of shaped discs at a plurality of stations including [[a]] an initial slot cutting station and a plurality of intermediate stations, said discs and said stations having centers, said stations and said strip having an imaginary center line and said centers falling substantially on said center line[[,]];;

cutting at said initial slot cutting station at least one slot a plurality of laterally extending slots through said strip between each pair of adjacent discs, said slot and simultaneously forming at least two three narrow deformable bridges connecting each pair of adjacent discs[[,]];;

orienting said discs at each of said intermediate stations while shaping said discs between said bridges at said intermediate stations[[,]]; and enabling adjustment of the distances between said pairs of adjacent discs at said intermediate stations by simultaneously deforming

deforming said bridges to both decrease the distance between said centers of each pair of adjacent discs when the distance between said centers is greater than the distance between said centers of two of said stations, and increase the distance between said centers of each pair of adjacent discs when the distance between said centers is lesser than the distance between said centers of two of said station while maintaining said centers of said discs substantially on said center line ~~when the distances between said centers of said discs differ from the distances between said centers of said stations, each of said two bridges having sides, and further comprising the step of forming said sides of at least one of said bridges at an angle relative to said center line.~~

COPY

15. (Currently Amended) A process for punching a series of shaped generally planar motor lamination discs from an elongated elongate strip of relatively stiff motor lamination steel material formed by pairs of wherein adjacent discs of said strip have having center-to-center distances, said strip having a longitudinal center line, said process comprising the steps of:

simultaneously cutting and shaping said series of shaped discs at progressively moving said strip through a plurality of stations including [[a]] an initial slot cutting station and a plurality of intermediate stations, said stations having center-to-center distances[[,]];

cutting at said initial slot cutting station at least one slot one or more laterally extending slots through said strip between each pair of adjacent discs, said slot forming at least and simultaneously forming at least two narrow deformable bridges connecting each pair of adjacent discs, each of said at least two bridges formed at least partly at an angle relative to said center line[[,]];

orienting said discs at each of said intermediate stations while shaping said discs between said bridges at each of said intermediate stations[[,]]; and

enabling adjustment of adjusting said center-to-center distances between pairs of adjacent discs at each of said intermediate stations by simultaneously deforming said bridges to decrease said center-to-center distances when said center-to-center distances are longer than said center-to-center distances of said stations and to increase said center-to-center distances when said center-to-center distances are shorter than said center-to-center distances of said stations when said center-to-center distances of said discs differ from said center-to-center distances of said stations, each of said two bridges having sides, and further comprising the step of forming said sides of at least one of said bridges at an angle relative to said center line, said sides of said at least one of said bridges being formed to a chevron shape.

16. (Currently Amended) A process according to Claim 13, and further including the step of cutting two of said bridges at substantially equal distances on opposite sides of said center line.

COPY

17. (Currently Amended) A progressive die and a strip of motor lamination material, said die including a series of die stations arranged along an imaginary center line, said stations including cutting means punches for cutting said strip and die pilot means pilots for positioning said strip, the pilot distances between said die pilot means pilots of successive stations being substantially constant, and said strip of motor lamination material being shaped by said die, said strip including a series of sections and said sections having strip pilots pilot means for mating with said die pilot means pilots, each of said sections including a geometric center, the strip distances between said strip pilots pilot means at times being variable and at times different from being longer than and at times being shorter than said pilot distances between said die pilots pilot means, and at least three deformable bridge means for bridges connecting adjacent sections of said strip, said sections being relatively stiff and said deformable bridge means bridges being sized both to deform shorten to decrease the strip distance between said strip pilots of said adjacent sections when longer than said die distances, and to lengthen to increase and thereby adjust the strip distance[[s]] between said geometric centers strip pilots of said adjacent sections when shorter than said die distances and said distances between said strip pilot means in order to compensate for said variable longer or shorter strip distances between said strip pilots pilot means while maintain said geometric centers substantially on said center line and while maintaining said strip in a generally planar condition, at least one of said bridge means having portions which are at an angle with said center line to facilitate said deformation.

18. (Currently Amended) A progressive die according to Claim 3, and further including a plurality of straddle pilots pilot means disposed adjacent said slot cutting punch means for engaging the sides of a selected disc and for properly positioning said selected disc during the formation of said slots slot.

19. (Currently Amended) A progressive die according to Claim 3, wherein said slot cutting means punch forms at least four of said bridges, said bridges being spaced apart on opposite sides of said center line.

20. (Previously Presented) A progressive die according to Claim 19, wherein two of said bridges are provided on each side of and spaced from said center line.

COPY

21. (Previously Presented) A progressive die according to Claim 20, wherein at least one of said bridges has a chevron shape.

22. (Currently Amended) A progressive die and a strip of motor lamination material, said die including a series of die stations arranged along an imaginary center line, said stations including cutting means punches for cutting said strip and die pilot means pilots for positioning said strip, the die distances between said die pilot means pilots of successive stations being substantially constant, and said strip of material being shaped by said die, said strip including a series of sections and said sections having strip pilot holes for mating with said die pilot means pilots, the strip distances between said strip pilot means holes at times being variable and at times different from longer and at times shorter than said die distances between said die pilot means pilots, each of said sections including a geometric center, and at least two deformable bridge means for bridges connecting adjacent sections of said strip, said die including a slot cutting means punch for forming said bridge means at least two bridges, said sections being relatively stiff and said at least two deformable bridges bridge means being sized to deform and both lengthen when said strip distance is shorter than said die distances between said die pilots, and shorten when said strip distance is longer than said die distances to thereby adjust said strip distances the distance between said geometric centers of said adjacent sections and said distances between said strip pilot means holes in order to compensate for said variable longer and shorter distances between said strip pilot means holes while maintaining said geometric centers substantially on said imaginary center line, said sections having outer sides, and said die further including straddle pilot means pilots for engaging with said outer sides of at least one of said sections adjacent said slot cutting means punch and for accurately locating said one of said sections.

23. (Currently Amended) A progressive die and a strip of motor lamination material according to Claim 22, wherein at least one of said bridge means at least two deformable bridges has a chevron shape.

24. (Previously Presented) A progressive die as set forth in claim 3, wherein said strip comprises motor lamination steel having a thickness of approximately .025

COPY

inch, and said die cuts each of said bridges to a lateral width in the range between substantially .650 inch and .070 inch.

25. (Previously Presented) A progressive die as set forth in Claim 24, wherein said lateral width is substantially .660 inch.

26. (Previously Presented) Apparatus as set forth in Claim 7, wherein said strip comprises motor lamination steel having a thickness of approximately .025 inch, and each of said bridges has a lateral width in the range between substantially .050 inch and .070 inch.

27. (Previously Presented) Apparatus as set forth in Claim 26, wherein said lateral width is substantially .060 inch

28. (Currently Amended) A process as set forth in Claim 12 13, wherein said strip comprises motor lamination steel having a thickness of approximately .025 inch, and said slot forms each of said bridges to a lateral width in the range between substantially .050 and .070 inch.

29. (Previously Presented) A process as set forth in Claim 28, wherein said lateral width is substantially .050 inch.

30. (Currently Amended) A progressive die and a strip of material as set forth in Claim 17, wherein said strip comprises motor lamination steel having a thickness of approximately .025 inch, and each of said bridge-means bridges has a lateral width in the range between substantially .050 inch and .070 inch.

31. (Previously Presented) A progressive die and a strip of material as set forth in Claim 30, wherein said lateral width is substantially .050 inch.

COPY

32 - 46. (Canceled)

47. (Currently Amended) Apparatus for shaping a series of adjacent motor lamination discs in a metal strip, each pair of adjacent discs in the strip being connected, and the geometric centers between adjacent discs being separated by center-to-center disc distances each of which can be longer or shorter than other of said disc distances, said apparatus comprising a progressive die having a succession of adjacent stations located along an imaginary center line, said geometric centers being located substantially on said center line, said adjacent stations having center-to-center die distances which are fixed, and means for maintaining accurate progression of said discs through said stations despite variations in said center-to-center distances of said adjacent discs while maintaining said geometric centers substantially on said center line, said means for maintaining comprising slot punch means punches for cutting a plurality of slots which form a plurality of narrow bridges connecting said adjacent discs, said plurality of narrow bridges being sufficiently narrow to be deformable deform to correct for said variations both decrease the disc distance between adjacent discs when the disc distance is longer than one of the die distances and increase the disc distance between adjacent discs when the disc distance is shorter than one of the die distances while maintaining said geometric centers substantially on said centerline for maintaining accurate progression of said discs through said stations, and pilot means straddle pilots at a station adjacent said slot punch means punches for engaging and accurately locating a disc while said slot punch means punches are cutting said slots.

48. (Currently Amended) Apparatus as set forth in Claim 47, wherein said pilot means comprises straddle pilots are engageable with edges of said discs.

49 - 51. (Canceled)

52. (Previously Presented) A progressive die according to Claim 20, wherein at least one of said bridges has an arcuate shape.

COPY

53. (Currently Amended) A progressive die and a strip of material according to Claim 22, wherein at least one of said bridge-means at least two deformable bridges has an arcuate shape.

54. (Currently Amended) A progressive die and strip of motor lamination material according to Claim 22, wherein said bridge-means at least two deformable bridges each has a chevron shape.

55. (Currently Amended) An elongate progressive die assembly having a longitudinal axis and a series of at least four successive die stations serially disposed along said longitudinal axis, the center-to-center spacing along said longitudinal axis between the die centers of each pair of adjacent die stations being fixed, at least some of said die stations including punch-means punches for shaping a series of interconnected discs in an elongate motor lamination metal strip, the center-to-center spacing between the geometric centers of adjacent discs in said strip being variable from at times longer and at times shorter than said fixed center-to-center spacing between said die centers of each pair of said adjacent die stations, means for maintaining accurate progression of said discs along said longitudinal axis through said die stations despite variations in said center-to-center spacing between said geometric centers of adjacent discs in said strip, said maintaining means including means at least two narrow bridges connecting adjacent discs in said strip, said bridges being deformable for enabling the center-to-center spacing along said longitudinal axis between said geometric centers of adjacent discs to be changed, said enabling means comprising a slot punch means for forming both at least one elongate slot extending in a lateral direction transverse to said longitudinal axis and said at least a pair of two narrow deformable bridges spaced apart in said lateral direction by said elongate slot and disposed at the opposite lateral ends of said elongate slot, said at least two bridges being sufficiently narrow in said lateral direction to deform be deformable to effect the changing of both lengthen said center-to-center spacing along said longitudinal axis between said geometric centers of said adjacent discs when shorter than said fixed center-to-center spacing between said die centers and shorten said center-to-center spacing along said longitudinal axis between said geometric centers of said adjacent discs when longer than said fixed center-to-center spacing between

COPY

said die centers, said at least two narrow deformable bridges and said at least one elongate slot being aligned in said lateral direction.

56. (Currently Amended) An elongate progressive motor lamination die assembly having a longitudinal axis and a series of successive die stations serially disposed along said longitudinal axis, the center-to-center spacing along said longitudinal axis between the die centers of each pair of adjacent die stations being fixed, at least some of said die stations including punch-means punches for shaping a series of interconnected electric motor lamination discs in an elongate scroll metal strip, the center-to-center spacing between the geometric centers of adjacent discs in said strip being variable from at times longer and at times shorter than said fixed center-to-center spacing between said die centers of each pair of said adjacent die stations, means a slot punch for forming at least one elongate slot extending in a lateral direction transverse to said longitudinal axis and a plurality of narrow bridges spaced apart in said lateral direction by said at least one elongate, said plurality of bridges being deformable for maintaining accurate progression of said discs along said longitudinal axis through said die stations despite variations in said center-to-center spacing in said geometric centers of adjacent discs in said strip[[,] by said maintaining means including means for enabling changes to the center-to-center spacing along said longitudinal axis between said geometric centers of adjacent discs, said enabling means comprising slot punch means for forming a plurality of elongate slots extending in a lateral direction transverse to said longitudinal axis and a plurality of narrow deformable bridges spaced apart in said lateral direction by said elongate slots and disposed at the opposite lateral ends of at least one of said elongate slots, said bridges being sufficiently narrow in said lateral direction to deform be deformable to effect said changing of both lengthen said center-to-center spacing along said longitudinal axis between said geometric centers of said adjacent discs when said center-to-center spacing is shorter than said fixed center-to-center spacing between said die centers, and shorten said center-to-center spacing along said longitudinal axis between said geometric centers of said adjacent discs when said center-to-center spacing is longer than said fixed center-to-center spacing between said die centers, said narrow deformable bridges and said elongate slots being aligned in said lateral direction and alternating such that an elongate slot is disposed between each pair of spaced-apart bridges, and straddle pilot-means pilots physically disposed in said die assembly at a die station adjacent to said slot punch means for physically engaging four sides of a disc in said die station and for accurately locating said

COPY

physically engaged disc in said die station while said at least one elongate slots slot and said plurality of narrow bridges are being formed by said slot punch means.

57. (New) A progressive die according to claim 3, wherein said slot cutting punch forms at least one of said bridges with portions disposed at an angle relative to said center line to facilitate said deformation.

58. (New) A progressive die according to claim 3, wherein said slot cutting punch forms each of said at least three bridges with portions disposed at an angle relative to said center line to facilitate said deformation.

59. (New) A process for forming a series of generally planar, shaped, motor lamination discs, the process comprising the steps of:

providing a plurality of die stations including an initial slot cutting station and one or more subsequent intermediate stations;

moving an elongate strip of relatively stiff generally planar motor lamination material through the plurality of die stations, the strip having interconnected adjacent discs along its length, said discs and said stations having centers, said stations and said strip having an imaginary center line and said centers falling substantially on said center line, said centers of each said pair of adjacent discs each spaced apart by a disc center distance and said centers of adjacent ones of said plurality of die stations spaced apart by a fixed die center distance;

cutting at said slot cutting station at least one slot laterally through said strip between each pair of adjacent discs, said slot forming at least two narrow deformable bridges connecting each said pair of adjacent discs;

engaging and accurately locating said discs at each of said intermediate stations while further progressively shaping each disc at said intermediate stations; and

adjusting said disc center distance between each said pair of adjacent discs between each of said die stations by both decreasing said disc center distances when longer than said fixed die center distances and increasing said disc center distances when shorter than said fixed die center distances while maintaining said centers of said discs substantially on said

COPY

centerline in order to align said centers of said discs with said centers of said stations during the step of moving.

60. (New) A process according to claim 59, wherein the step of moving further comprises forming each of said discs having outer sides, and wherein the step of engaging and accurately locating includes engaging said outer sides of each disc while at said slot cutting station and thereby orienting said disc at said slot cutting station while cutting said at least one slot.

61. (New) A process according to claim 60, wherein the step of engaging and accurately locating further comprises arranging straddle pilots at said slot cutting station to engage said outer sides of each disc while at said slot cutting station.

62. (New) A process according to claim 59, wherein the step of providing a plurality of die stations further comprises providing a pilot hole punch at said slot cutting station, and further comprising the steps of forming one or more non-centrally located pilot holes in each disc at said slot cutting station and aligning a corresponding pilot pin into each of said pilot holes at each die station subsequent to said slot cutting station to thereby lengthwise position and orient said discs at each of said intermediate stations.

63. (New) A process according to claim 59, wherein the step of cutting further comprises cutting at said slot cutting station a plurality of said slots between each pair of adjacent discs, said slots forming at least three of said narrow deformable bridges connecting each said pair of adjacent discs.

64. (New) A process according to claim 14, wherein the step of cutting further comprises simultaneously forming said sides of each of said at least three bridges at an angle relative to said center line.

COPY

65. (New) A process according to claim 15, wherein the step of cutting further comprises forming said at least two bridges being formed having a chevron shape.

66. (New) A progressive die and strip of motor lamination material according to claim 17, wherein said at least three deformable bridges have portions which are at an angle with said center line to facilitate said lengthening and said shortening.

67. (New) A combination progressive motor lamination die and a strip of motor lamination material, said combination comprising:

a series of die stations arranged along an imaginary center line of the motor lamination die, said stations including die pilots for positioning said strip and including substantially constant die distances between said die pilots of successive stations;

a series of interconnected generally planar motor lamination disc sections forming said strip, said disc sections each having a geometric center and having one or more pilot features that cooperate with said die pilots, the strip having at least two deformable bridges connecting each pair of adjacent disc sections, and pilot distances that vary both longer and shorter than a nominal distance equal to said constant die distance between the pilot features of adjacent ones of the discs.;

a slot cutting station of the motor lamination die arranged to initially form said bridges separated from another by one or more simultaneously formed laterally extending slots, said at least two deformable bridges configured and arranged at least to decrease the pilot distances between corresponding pilot features of adjacent pairs of said disc sections when said pilot distances are longer than said nominal distance while maintaining said geometric centers substantially on said imaginary center line.

68. (New) A combination according to claim 67, wherein said pilot features of said disc sections include outer sides of each disc in said strip, and wherein said die pilots include straddle pilots provided within at least the slot cutting station and arranged to engage said outer sides of a disc section for accurately locating said disc section.

COPY

69. (New) A combination according to claim 67, wherein said pilot features of said disc sections include a plurality of pilot holes formed in each of said disc sections, and wherein said die pilots include a plurality of pilot pins provided at each of said die stations and arranged to engage a respective one of the pilot holes of each disc section at each die station to locate and orient said disc sections.

70. (New) Apparatus for shaping a series of motor lamination discs interconnected in a metal strip, each disc having a geometric center separated from adjacent disc geometric centers by strip center-to-center distances subject to plus or minus variation along the strip, said apparatus comprising:

a progressive die having a succession of adjacent stations located along the length of an imaginary center line, said geometric centers of said discs located substantially on said center line, said adjacent stations having substantially the same die center-to-center distance between each adjacent station;

an initial die station for cutting at least one slot which simultaneously forms a plurality of narrow bridges connecting adjacent discs in said metal strip, said plurality of narrow bridges being sufficiently narrow to deform both to decrease said strip center-to-center distances between said geometric centers of said adjacent discs when longer than said die center-to-center distance and to increase said center-to-center distances between said geometric centers of said adjacent discs when shorter than said die center-to-center distance; and

straddle pilots at said initial die station for engaging and accurately lengthwise and rotationally locating a disc while said plurality of slots are cut between a pair of adjacent discs.

71. (New) An apparatus according to claim 70, further comprising:

at least one pilot hole formed in each of said discs spaced from said geometric center of said each of said discs; and

at least one pilot pin provided at each die station at least subsequent to said initial die station to align with said at least one pilot hole for maintaining accurate progression of said discs through said die stations.

COPY

72. (New) An apparatus according to claim 71, where said at least one pilot hole is formed at said initial die station.

73. (New) An apparatus according to claim 70, wherein the initial die station is configured to cut a plurality of slots and simultaneously form at least three of said bridges.

74. (New) A process according to claim 14, further comprising the step of forming at least one of said bridges with portions arranged at an angle relative to said centerline.

75. (New) A process according to claim 15, wherein the step of cutting further comprises forming a plurality of said laterally extending slots and simultaneously forming at least three of said narrow deformable bridges connecting each pair of adjacent discs.

76. (New) A progressive die according to claim 3, wherein said slot cutting machine forms said at least three narrow deformable bridges having portions at an angle relative to said centerline.

77. (New) A combination progressive motor lamination die and a strip of motor lamination material according to claim 67, wherein said bridges are further configured and arranged to also increase strip distances as needed between said geometric centers and between corresponding pilot features of adjacent pairs of said disc sections while maintaining said geometric centers substantially on said imaginary centerline.

78. (New) A progressive die for shaping a consecutive series of adjacent generally planar motor lamination discs from a strip of relatively stiff material, each of said discs having a geometric center, said strip having a longitudinal centerline and said geometric centers falling substantially on said centerline, said die comprising a series of adjacent die stations including an initial die station and one or more additional die stations which receive

COPY

said strip and which shape said discs, said die including a slot cutting punch at the initial die station for forming at least one laterally extending slot between adjacent discs and for simultaneously forming at least two narrow deformable bridges connecting said adjacent discs, said bridges having a lateral width and thickness sufficient to enable deformation thereof at additional die stations following said initial die station to at least decrease the distance between said geometric centers of said adjacent discs when said distance is greater than a fixed center-to-center distance between adjacent die stations, while maintaining said geometric centers substantially on said centerline.

79. (New) A progressive die according to claim 78, wherein said bridges have a lateral width and thickness sufficient to enable deformation thereof at additional die stations following said initial die station to also increase the distance between said geometric centers of said adjacent discs when said distance is lesser than said fixed center-to-center distances while maintaining said geometric centers substantially on said centerline.

80. (New) Apparatus comprising a strip of relatively stiff material including a series of consecutive generally planar motor lamination discs formed along a length thereof, each of said discs including a center and said centers falling substantially on an imaginary centerline of said strip, at least two adjacent discs having one or more laterally extending slots therebetween forming at least two narrow deformable bridges connecting said adjacent discs, said bridges having a lateral width and thickness sufficient to deform to at least decrease the distance between said centers of said adjacent discs when said distance is longer than a die center-to-center distance to align each said disc with die stations during formation, while maintaining said centers substantially on said centerline, and at least one of said bridges including portions which are chevron-shaped.

81. (New) Apparatus according to claim 80, wherein said bridges have a lateral width and thickness sufficient to enable deformation to also increase the distance between said centers as needed during die formation of said discs while maintaining said center substantially on said centerline.

COPY

82. (New) A process for punching a series of shaped motor lamination discs from an elongate strip of relatively stiff material to form adjacent discs, the process comprising the steps of simultaneously cutting and shaping said series of shaped motor lamination discs at a plurality of stations including a slot cutting station and a plurality of intermediate stations, said series of shaped motor lamination discs and said plurality of stations each having centers, said plurality of stations and said strip having an imaginary centerline and said centers falling substantially on said centerline, cutting at said slot cutting station at least one slot through said strip between adjacent discs, said slot forming at least two narrow deformable bridges connecting said adjacent discs, orienting each disc of said series of shaped motor lamination discs at said intermediate stations while shaping each said disc at said intermediate stations, and enabling the distances between said adjacent discs at said intermediate stations to at least be decreased by simultaneously deforming said bridges while maintaining said centers of said adjacent discs substantially on said centerline when the distances between said centers of said adjacent discs are greater than the distances between said centers of said stations, each of said discs having outer sides, and further comprising the step of engaging said outer sides of a disc which is adjacent said slot cutting station and thereby orienting said disc at said slot cutting station while cutting said at least one slot.

83. (New) A process according to claim 82, wherein the step of enabling the distances further comprises enabling the distances between said adjacent discs at said intermediate stations to be increased by simultaneously deforming said bridges while maintaining said centers on said adjacent discs substantially on said centerline when the distances between said centers of said adjacent discs are lesser than the distances between said centers of said stations.

84. (New) A progressive die and strip of motor lamination material, said die including a series of die stations arranged along an imaginary centerline, said stations including punches for cutting said strip and die pilots for positioning said strip, the distances between said die pilots of successive stations being substantially constant, and said strip of motor lamination material being shaped by said die, said strip including a series of sections and said sections having strip pilots for mating with said die pilots, each of said sections including a geometric center, distances between said strip pilots at times being variable and at

COPY

times being longer than and at times being shorter than said constant distance between said die pilots, and at least three deformable bridges connecting adjacent sections of said strip, said sections being relatively stiff and said deformable bridges being sized to at least shorten to decrease the distance between said geometric centers and said strip pilots of said adjacent sections in order to compensate for said longer distances between said strip pilots while maintaining said geometric centers substantially on said centerline and while maintaining said strip in a generally planar condition.

85. (New) A progressive die and a strip of motor lamination material according to claim 84, wherein said deformable bridges are also sized to lengthen to increase the distance between said geometric centers and said strip pilots of said adjacent sections in order to compensate for said shorter distances between said strip pilots.

86. (New) A process for punching a series of shaped motor lamination rotors and stators from an elongate strip of relatively stiff material having adjacent discs, the process comprising the steps of simultaneously cutting and shaping said series of shaped motor lamination rotors and stators at a plurality of stations including a slot cutting station and a plurality of intermediate stations, said series of shaped motor lamination rotors and stators and said plurality of stations each having centers, the distances between said center of said adjacent discs being variable said plurality of stations and said strip having an imaginary centerline and said centers falling substantially on said centerline, cutting at said slot cutting station at least one slot through said strip between adjacent discs, said slot forming at least two narrow deformable bridges connecting said adjacent discs, orienting each disc of said adjacent discs at said intermediate stations while shaping each said disc at said intermediate stations, enabling the variable distances between said adjacent discs at said intermediate stations to be both increased and decreased by simultaneously deforming said bridges while maintaining said centers of said adjacent discs substantially on said centerline when the distances between said centers of said adjacent discs are respectively lesser than or greater than fixed distances between said centers of said stations, each of said discs having outer sides, engaging said outer sides of a disc which is adjacent said slot cutting station and thereby orienting said disc at said slot cutting station while cutting said at least one slot, and

COPY

further cutting and shaping each of said discs to form one of said rotors and one of said stators and separating each of said discs from one another.

87. (New) A process for forming a series of generally planar, shaped, motor lamination rotors and stators, the process comprising the steps of:

providing a plurality of die stations including an initial slot cutting station and one or more subsequent intermediate stations;

moving an elongate strip of relatively stiff generally planar motor lamination material through the plurality of die stations, the strip having interconnected adjacent discs along its length, said discs and said stations having centers, said stations and said strip having an imaginary centerline and said centers falling substantially on said centerline, said centers of each said pair of adjacent discs each spaced apart by a variable center distance and said centers of adjacent ones of said stations being spaced apart by a fixed center distance;

cutting at said slot cutting station at least one slot laterally through said strip between each pair of adjacent discs, said slot forming at least two narrow deformable bridges connecting each said pair of adjacent discs;

engaging and accurately locating said discs at each of said intermediate stations while further progressively shaping each disc at said intermediate stations;

adjusting said variable center distance between each said pair of adjacent discs between each of said die stations by both decreasing said center distances when said variable center distance is longer than said fixed center distance and increasing said center distances when said variable center distance is shorter than said fixed center distance while maintaining said centers of said discs substantially on said centerline in order to align said centers of said discs with said centers of said stations during the step of moving; and

separating each of said adjacent discs from one another and cutting an inner rotor from an outer stator of each of said discs.